

CLAIMS LISTING (AMENDMENT)

1. (Currently Amended) A method of interactive television wherein video signals are generated based on real time user perception of video images comprising the steps of:
 - forming a video signal of an entire frame of an initial video image in a video signal formation component, said initial video image has a predetermined quality level and predetermined dimension;
 - said initial video image is divided into a plurality of sector video images with predetermined boundaries, said sector video images having the same predetermined quality level;
 - converting the video signal of said initial video image in a video signal transmitter conversion component into a series of sector video signals corresponding to said sector video images;
 - transmitting said sector video signals from said transmitter conversion component via data channels, via a plurality of group user intermediate conversion components, to a plurality of user display components, said intermediate conversion components are substantially connected to said user display components;
 - converting said quality levels of said sector video signals, such that a corresponding quality level of at least one said sector video image is successively reduced, said conversion is provided in said group user intermediate conversion components;
 - forming an entire frame video image on the user display component, said user display component is connected to one group-user intermediate conversion component chosen from said plurality of group-user intermediate conversion components, said forming is based on said sector video signals, said entire frame video image being perceived by at least one user; said sector video images having the same predetermined boundaries and dynamically changeable quality levels;
 - determining eye characteristics of a user by employing at least one sensor in operative communication with one eye of the user, said eye characteristics are determined relatively to the entire frame video image formed by the user display component and perceived at an eye of said user, and by employing data from said sensor to dynamically establish coding characteristics of each user [[,]] ;
 - generating display interrogation signals within a plurality of computing components of a first type, each of said first type computing components is connected to a predetermined display component

chosen from said user display components, taking into account an eye resolution of a corresponding user, and said coding characteristics;

said display interrogation signals containing information on the quality levels of at least one sector of the video image;

- transmitting said display interrogation signals to one of a plurality of computing components of a second type, connected to said group-user intermediate conversion component;

- transmitting said display interrogation signals immediately to said user display component;

- generating a plurality of group interrogation signals within a plurality of computing components of the second type, said group interrogation signals are generated based on the display interrogation signals of at least one computing component connected to a corresponding computing component of the second type;

- calculating said quality levels of the sector video image within said second type computing components, in this connection, the quality level of said sector video signals is set as the highest quality level for the respective sectors of the video images corresponding to said display interrogation signals;

- converting the quality levels of said sector video signals, such that a corresponding quality level of at least one said sector video image is reduced, said conversion is provided in said group-user intermediate conversion component;

wherein,

- said group interrogation signals are taken into account with a respective concurrent adjustment in converting said video signals; and

- said forming of the entire frame video image on said user display component, based on said sector video signals, is controlled by said display interrogation signal of said corresponding user.

2 (Canceled).

3. (Currently Amended) A method of interactive television wherein video signals are generated based on real time user perception of video images comprising the steps of:

- forming a predetermined number of video signals of an entire frame of an initial video image with different predetermined quality levels, including a lowest quality level and a number of

higher quality levels, in a video signal formation component; said initial video image is characterized by predetermined boundaries, said boundaries include external boundaries;

- transmitting the video signal provided for the lowest quality level of the entire video image from the video signal formation component via conventional signal channels of a conventional video broadcasting system directly to a plurality of display components, said plurality of display components including a number of user display components;
- transmitting said video signals of the higher quality levels from the video signal formation component via data channels, via a plurality of intermediate conversion components, to said user display components; said intermediate conversion components are substantially connected to said user display components;
- changing said boundaries of said video signals of the higher quality levels in the intermediate conversion component; said changing results in formation of a number of areas of each said video signal, wherein the boundaries of at least one of said areas are narrowed;
- forming the entire frame video image on a user display component, chosen from said plurality of user display components, said user display component is connected to a group-user intermediate conversion component chosen from said plurality of intermediate conversion components; wherein said forming is based on the video signal of the entire frame video image of said lowest quality level, and on the video signals of said higher quality levels;
- perceiving the entire frame video image by at least one user;
- determining eye characteristics of the user by employing at least one sensor in operative communication with one eye of the user, said eye characteristics are determined relatively to the entire frame video image formed by the user display component and perceived at an eye of said user, and by employing data from said sensor to dynamically establish coding characteristics;
- generating a plurality of display interrogation signals for one of said display components, said generating is provided in one of the first type computing components, said display interrogation signals provide coding said boundaries, taking into account the eye resolution and **dynamic** dynamically establish coding characteristics of the eyes of users of the corresponding display component, said dynamic characteristics are determined in relation to the video image, and taking into account the characteristics of said predetermined quality levels [[.]] ;

said display interrogation signals containing information on the external boundaries of at least one area of the video image with one of the predetermined quality levels;

- transmitting said display interrogation signals to a plurality of computing component of a second type, connected to said group-user intermediate conversion component;

- transmitting said display interrogations signals immediately to said user display component;

- generating a plurality of group interrogation signals within a plurality of computing components of the second type, said group interrogation signals are generated based on the display interrogation signals of at least one computing component connected to a corresponding computing component of the second type;

- calculating said external boundaries of the area video image within said second type computing components, in this connection, coding said external boundaries of said areas of an equal quality level for said users or said group of users, the external boundaries of each said quality level include the external boundaries of all said areas with predetermined equal quality levels for the respective levels of the video images corresponding to said display interrogation signals;

wherein

said changing of said boundaries of said video signals of the higher quality levels is controlled by said group interrogation signals, taken into account with a respective concurrent adjustment in converting said video signals; and

said forming of the entire frame video image on the user display component, based on said area video signals, is controlled by said display interrogations signals.

4. (Canceled)

5. (Currently Amended) The method of claim 3, wherein said forming video signals is provided for said different quality levels, and further comprises:

changing the boundaries of each said area of the video image in the intermediate conversion component except for the area of the highest quality level, said boundaries including internal and external boundaries, the internal boundaries of all the areas, except the highest quality level area ~~sector~~, correspond to the external boundaries of the video image with the next higher quality level.

6. (Canceled)

7. (Previously Presented) A method of interactive television wherein a video signal is generated based on real time user perception of video images comprising the steps of:

- forming a video signal of an entire frame of a video image, and/or
- forming video signals
 - of sectors of said video image with substantially equal quality levels and predetermined boundaries, or
 - an entire frame of a video image with different quality levels, in a video signal formation component;
- converting the video signals at least one time in at least one video signal conversion component into a series of video signals of the video image sectors and/or
- converting the level of quality of the video image sectors, and/or
- changing said predetermined boundaries of said sectors,
- transmitting said video signals via data channels, at least, to one said conversion component and to at least one display component,
- forming a video image on the display component, said video image being perceived, at least, by one user,
- determining eye characteristics by employing at least one sensor in operative communication with one eye of the user, said characteristics are defined relatively to the video image formed by the user display component and perceived at an eye of said user, and by employing data from said sensor to dynamically establish signal coding characteristics,
- transmitting said signals having said coding characteristics to at least one computing component;
- generating interrogation signals with said computing component, taking into account the eye resolution, communicated in the coding characteristics, said interrogation signals include a first category containing information on the boundaries of at least one sector of the video image and/or a second category containing information on the quality levels of at least one sector of the video image;

- transmitting said interrogation signals to at least components of the following types: said formation component, said conversion component, and said display component;

wherein:

the interrogation signals are taken into account with a respective concurrent adjustment in forming of said video signals, converting said video signals, and forming said image;

said forming video signals is provided for said different quality levels, and further comprises:

- transmitting said video signals via data channels, at least, to one said conversion component,
- subjected to said first category interrogation signals, changing the boundaries of each sector of the video image in the conversion component except for the sector of the highest quality level, said boundaries including internal and external boundaries, the internal boundaries of all the sectors, except the highest quality level sector, correspond to the external boundaries of the video signal with the next higher quality level;

- the first quality level corresponds to a basic level;

- said transmitting the video signal is provided for the basic level of the entire video image via data channels of a conventional video broadcasting system to every said display component directly, or via the conversion component, associated with the display component; and
- subjected to said interrogation signals containing at least information on the boundaries of a sector with the lowest quality level, changing the internal boundaries of each sector of the video image in the conversion component.

8. (Previously Presented) The method of claim 3 wherein said forming the video signal of the entire video image of a predetermined low quality level in the video signal formation component further comprises: calculating a value of a pixel of the video image of said low quality level as the mean value of values of pixels of a predetermined high quality level of the video image, wherein said pixel has predetermined boundaries, said pixels of a predetermined high quality level of the video image are restricted with the boundaries of said pixel of the predetermined low quality level.

9. (Previously Presented) The method of claim 3, wherein said forming the video signal of the entire video image of a predetermined low quality level in the video signal formation component further comprises: calculating a value of a pixel of the video image of said low quality level as a value of a pixel of a predetermined high quality level of the video image, wherein said pixel of the video image of said low quality level has predetermined boundaries, said pixel of the predetermined high quality level of the video image is located inside of said pixel of the predetermined low quality level.

10. (Currently Amended) A method of interactive television wherein video signals are generated based on real time user perception of video images comprising the steps of:

- forming a predetermined number of video signals of an entire frame of an initial video image with different predetermined quality levels in a video signal formation component; said initial video image is characterized by predetermined boundaries; said different predetermined quality levels include a number of quality levels starting from a lowest first quality level, the number of quality levels includes a second quality level corresponding to a first extended quality level, a third quality level corresponding to a second extended quality level, and so on; said forming a video signal of the first extended quality level in the video signal formation component further comprises: subtraction of the first quality level video signal from the second quality level video signal whereas said forming the video signal of the second and higher numbers extended quality levels are obtained by subtraction from the respective quality level video signal of a video signal with the next quality level;
- transmitting the video signal provided for the lowest quality level via conventional signal channels of a conventional video broadcasting system directly to a plurality of display-conversional components, each said display-conversional component is connected to a corresponding said user display component;
- transmitting said video signals of the extended quality levels from the video signal formation component via data channels, via a plurality of intermediate conversion components, to said display-conversional components, said intermediate conversion components are substantially connected to said display-conversional components;

- changing said boundaries of said video signals of the extended quality levels in the intermediate conversion component; said changing results in formation of a number of areas of each said video signal, wherein the boundaries of at least one of said areas are narrowed;
- summarizing the video signals of the lowest quality level and of all of the extended quality levels, thereby obtaining a summary video signal of the entire video image in the display-conversion component connected to the corresponding user display component;
- transmitting said summary video signal to a user display component, chosen from said plurality of user display components;
- forming the entire frame video image on the user display component, said user display component is connected to one of said display conversion components chosen from said plurality of intermediate conversion components;
- perceiving the entire frame video image by at least one user;
- determining eye characteristics of the user by employing at least one sensor in operative communication with one eye of the user, said eye characteristics are determined relatively to the entire frame video image formed by the user display component and perceived at an eye of said user, and by employing data from said sensor to dynamically establish coding characteristics,
- generating a plurality of display interrogation signals for one of said display components, said generating is provided in one of the first type computing components, said display interrogation signals provide coding said boundaries, taking into account an eye resolution and dynamic characteristics of the eyes of users of the corresponding user display component, said dynamic characteristics are determined in relation to the video image, and taking into account the characteristics of said predetermined quality levels [[.]] ;
said display interrogation signals containing information on the external boundaries of at least one area of the video image with one of the predetermined quality levels;
- transmitting said display interrogation signals to one component of a plurality of computing components of a second type, connected to said group-user intermediate conversion component;
- transmitting said display interrogations signals immediately to said user display-conversion component;
- generating a plurality of group interrogation signals within the second type computing components; said group interrogation signals are generated based on the display interrogation signals of at least one computing component connected to a corresponding computing component of the second type;

- calculating said external boundaries of the area video image within said second type computing components, in this connection, coding said external boundaries of said areas of an equal quality level for said users or said group of users, the external boundaries of each said quality level include the external boundaries of all said areas with the corresponding quality level;

wherein

said changing of said boundaries is controlled by said group interrogation signals taken into account with a respective concurrent adjustment in converting said video signals;

said forming of the entire frame video image on the user display component, based on said area video signals, is controlled by said display interrogations signals; and

subjected to said group interrogation signals containing at least information on the boundaries of said areas of the video image of any of said extended quality levels, at least one time changing the boundaries of the areas in at least one intermediate conversion component;

in this connection,

the video signals of the second and higher numbers quality levels are converted in a display-conversional component connected with the user display component for every video signal.

11. (Previously Presented) The method of claim 10, wherein said users consist of two types of users: registered users and non-registered users; said transmitting the video signal of the lowest quality level is provided to the corresponding user display components of the registered and non-registered users.

12 – 13 (Canceled)

14. (Previously Presented) The method of claim 3, wherein said user display component is represented by a conventional CRT including: a screen, a gun-cathode, an electronic beam deflector, a size screen dot unit for dynamic control of the dot on the screen; said method further comprises:

- successive transferring video signals of said areas with different quality levels to the gun-cathode;

- synchronous transferring said display interrogation signals for said areas each, wherein said display interrogation signals carry encoding information on the boundaries of said each area,

said transferring the display interrogation signals is provided to said electronic beam deflector, said synchronous transferring of said display interrogation signals is provided synchronously with the entire frame video image; and

- synchronous transferring said display interrogation signals for said areas each, wherein said display interrogation signals carry encoding information on the quality levels of said areas, and said transferring the display interrogation signals is provided to said size screen dot unit, said synchronous transferring of said display interrogation signals is provided synchronously with the entire frame video image.

15. (Previously Presented) A method of interactive television wherein a video signal is generated based on real time user perception of video images comprising the steps of:

- forming a video signal of an entire frame of a video image, and/or
- forming video signals of
 - sectors of said video image with substantially equal quality levels and predetermined boundaries, or
 - an entire frame of a video image with different quality levels, in a video signal formation component;
- converting the video signals at least one time in at least one video signal conversion component into a series of video signals of the video image sectors and/or
 - converting the level of quality of the video image sectors, and/or
 - changing said predetermined boundaries of said sectors,
- transmitting said video signals via data channels, at least, to one said conversion component and to at least one display component,
- forming a video image on the display component, said video image being perceived, at least, by one user,
- determining eye characteristics by employing at least one sensor in operative communication with one eye of the user, said characteristics are defined relatively to the video image formed by

the user display component and perceived at an eye of said user, and by employing data from said sensor to dynamically establish signal coding characteristics,

- transmitting said signals having said coding characteristics to at least one computing component;
- generating interrogation signals with said computing component, taking into account the eye resolution, communicated in the coding characteristics, said interrogation signals include a first category containing information on the boundaries of at least one sector of the video image and/or a second category containing information on the quality levels of at least one sector of the video image;
- transmitting said interrogation signals to at least components of the following types: said formation component, said conversion component, and said display component;

wherein:

the interrogation signals are taken into account with a respective concurrent adjustment in forming of said video signals, converting said video signals, and forming said image;

said forming video signals is provided for said different quality levels, and further comprises:

- transmitting said video signals via data channels, at least, to one said conversion component,
- subjected to said first category interrogation signals, changing the boundaries of each sector of the video image in the conversion component except for the sector of the highest quality level, said boundaries including internal and external boundaries, the internal boundaries of all the sectors, except the highest quality level sector, correspond to the external boundaries of the video signal with the next higher quality level;

said converting a video signal of the entire video image is provided into a series of video signals of the entire video image with different quality levels;

said different quality levels include a number of quality levels starting from a lowest quality level; said method further comprises: a preliminary step of recording video signals of an entire frame of a video image of the lowest quality level, transmitting said recorded video signals except for the highest quality level video signals, and said recorded video signals of the lowest

quality level are read up during the step of transmitting said video signals, thereby reducing the information volume to be transmitted.

16. (Canceled)

17. (Previously Presented) The method of claim 10, wherein said forming the video signal of the entire video image or of said areas of the video image of a predetermined low quality level in the formation component further comprises: identifying a value of a pixel of the video image of said low quality level as the mean value of pixels values of a predetermined high quality level of the video image, wherein said pixels values forming a part of the video image area, restricted with the boundaries of said pixel of the predetermined low quality level.

18. (Previously Presented) The method of claim 7, wherein said forming the video signal of the entire video image or the video signals of said sectors of the video image of a predetermined low quality level in the formation component further comprises: identifying a value of a pixel of the video image of said low quality level as the mean value of pixels values of a predetermined high quality level of the video image, wherein said pixels values forming a part of the video image sector, restricted with the boundaries of said pixel of the predetermined low quality level.

19. (Previously Presented) The method of claim 10, further comprising the steps of:

- determining a value of one of the pixels of the video signal of the extended quality level of the video image in the video signal formation component or in the video signal conversion component by subtraction of said value of a predetermined high quality level pixel of the video image from a value of the video signal pixel of the basic quality level; and
- forming a video signal pixel with a basic quality level in the video signal conversion component or in the information display component and a video signal pixel of the high quality level of the video image, by way of summing the video signal pixel of the extended quality level and the video signal pixel of the basic quality level.

20. (Canceled)

21. (Previously Presented) The method of claim 10 wherein said method further comprises: a preliminary step of recording video signals of a predetermined lowest quality level, transmitting said video signals of a predetermined extended quality level to the user display components, and reading up said recorded video signals of the lowest quality level during the step of transmitting said video signals, thereby reducing the information volume to be transmitted.



Aleksandr Smushkovich
U.S. Patent Practitioner #56,997
USA PATENT SERVICE COMPANY
POB 140505
Brooklyn, NY 11214